Yiming Che

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PROFESSIONAL SKILLS & KNOWLEDGEasdasdas

- **Programming Languages:** Python, Matlab, R
- **Skills:** Linux, Slurm, Git, MySQL, Bash script
- **Research Interests:** Generative model, Bayesian deep learning, Gaussian process, Active learning

EDUCATION BACKGROUND

- **Binghamton University, State University of New York, NY, United States**
  Department of Systems Science and Industrial Engineering
  Doctor of Philosophy in Systems Science — May 2023
  Advisor: Dr. Changqing Cheng
- **Binghamton University, State University of New York, NY, United States**
  Department of Systems Science and Industrial Engineering
  Master of Science in Industrial Engineering — May 2018
- **Capital University of Economics and Business (CUEB), Beijing, China**
  Department of Industrial Engineering
  Bachelor of Science in Industrial Engineering — July 2017

PROFESSIONAL EXPERIENCE

- **Postdoctoral Scholar at Arizona State University** (Advised by Dr. Teresa Wu) — 2023-Present
  1. **Brain Tumor Segmentation**
  2. **Headache Classification**
  3. **Multi-modality Fusion for Diagnosis**
- **Research Assistant at Binghamton University** (Advised by Dr. Changqing Cheng) — 2019-2023
  1. **COVID Outbreak Prediction**
     - Physics-informed neural network (PINN) for the prediction of COVID outbreak
       - Trying to include Bayesian framework in traditional PINN for robust prediction
     - Deep Gaussian process (DGP)
       - Working on DGP with active learning for robust sequential design
  2. **Surrogate Modeling and Active Learning/Sequential Design**
     - Developed a novel surrogate model which combines generalized polynomial chaos and stochastic kriging model for efficient surrogate modeling of stochastic systems
       - Significantly reduced computational budget compared to Monte Carlo simulation
       - Achieved high accuracy with small computational budget compared to Monte Carlo simulation
     - Developed a new expected improvement-based sampling algorithm with Gaussian process for active learning/sequential design
       - Reduced size of training set by around 90% compared to traditional one-shot design
       - Achieved high accuracy when only a small fraction of training set is used compared to traditional one-shot design
     - Developed a K-center-based sampling algorithm with relevant vector machine for active learning/sequential design
       - Significantly reduced required training data to achieve high accuracy
     - Developed a batch-sampling strategy for efficient contour estimation
       - Significantly reduced training time compared to the single-sample selection strategy
       - Outperform the state-of-the-art method (weighted K-means selection)

3. **Uncertainty Quantification for Machining Process**
   - Developed uncertainty quantification framework using generalized polynomial chaos expansion for machining process
     - Reduced computational budget of time-domain simulations for uncertainty quantification
     - Devised maximum entropy method for density estimation

AWARD & HONOR

- Excellence in Systems Science Research Award, Binghamton University 2023
- Graduate School Travel Grant, Binghamton University 2022
- INFORMS Bonder Foundation Award 2021
- Finalist, IISE-DAIS Mobile App Competition at 2021 IISE Annual Conference and Expo 2021
- Binghamton University Graduate Student Excellence Award in Research **(top 1%)** 2021
- Travel Grant of Midwest Dynamical Systems Conference 2019, University of Illinois at Chicago 2019
- Second Place, Best Student Paper Competition at 2019 IISE Annual Conference and Expo (Healthcare track) 2019
- Honorable Mention, Binghamton University Research Day Poster Competition, 2018 2018
- National Scholarship, Capital University of Economics and Business 2015

JOURNAL PUBLICATIONS

1. **Che, Y.** and Cheng, C. "Physical-statistical learning towards resilience assessment for power generating systems," *Physica A: Statistical Mechanics and its Applications* (2023): 128584. https://doi.org/10.1016/j.physa.2023.128584
2. **Che, Y.**, Muller, J and Cheng, C. "Dispersion-enhanced sequential batch sampling for contour estimation," *Quality and Reliability Engineering International*. https://doi.org/10.1002/qre.3245
3. Ma, Q., **Che, Y.**, Cheng, C. and Wang, Z. "Characterizations and optimization for resilient manufacturing systems with considerations of process uncertainties," *Journal of Computing and Information Science in Engineering* (2023): 011007. https://doi.org/10.1115/1.4055425
4. Wan, J., **Che, Y.**, Wang, Z. and Cheng, C. "Uncertainty quantification and optimal robust design for machining operations," *Journal of Computing and Information Science in Engineering* 23.1 (2022): 0110005. https://doi.org/10.1115/1.4055039
5. **Che, Y.** and Cheng, C. "Active learning and relevance vector machine in efficient estimate for basin stability of dynamic networks," *Chaos: An Interdisciplinary Journal of Nonlinear Science* 31.5 (2021): 053129. https://doi.org/10.1063/5.0044899.
6. **Che, Y.**, Guo, Z. and Cheng, C. "Generalized polynomial chaos-informed efficient stochastic Kriging," *Journal of Computational Physics* (2021): 110598. https://doi.org/10.1016/j.jcp.2021.110598.
7. Wu, X., Zheng, Y., **Che, Y.** and Cheng, C. "Pattern recognition and automatic identification of early-stage atrial fibrillation," *Expert Systems with Applications* (2020): 113560. https://doi.org/10.1016/j.eswa.2020.113560.
8. **Che, Y.**, Cheng, C., Liu, Z. and Zhang, Z. "Fast basin stability estimation for dynamic systems under large perturbations with sequential support vector machine," *Physica D: Nonlinear Phenomena* (2020): 132381. https://doi.org/10.1016/j.physd.2020.132381.
9. **Che, Y.**, Liu, J. and Cheng, C. "Multi-fidelity modeling in sequential design for identification of stability region in dynamic time-delay systems," *Chaos: An Interdisciplinary Journal of Nonlinear Science* 29.9 (2019): 093-105. https://doi.org/10.1063/1.5097934.
10. **Che, Y.** and Cheng, C. "Uncertainty quantification in stability analysis of chaotic systems with discrete delays," *Chaos, Solitons & Fractals* 116 (2018): 208-214. https://doi.org/10.1016/j.chaos.2018.08.024.